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APPLICATION NO. 4	FILING DATE 10/21/98	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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10/21/07/08

EXAMINER

ART UNIT	PAPER NUMBER
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DATE MAILED: 07/08/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/811,434

Applicant(s)
LEE ET AL

Examiner
Scott Bushey

Group Art Unit
1724



☒ Responsive to communication(s) filed on Jun 10, 1998

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 5-8 and 13-34 is/are pending in the application.

Of the above, claim(s) 5-8, 13-16, and 23-29 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 17-22 and 30-34 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

1. Applicant's election without traverse of Group III, claims 17-34, as well as weir species WB (Fig. 5B) and downcomer species DB (Fig. 7B) in Paper No. 7 is acknowledged.

Accordingly, claims 17-22, and 30-34, which read on each of the elected species have been examined herein on the merits, while claims 5-8, 13-16, and 23-29 are withdrawn from further consideration as being drawn to either a non-elected invention (claims 5-8, and 13-16) or a non-elected species.

2. The disclosure is objected to because of the following informalities: page 13, line 15, "130" should be replaced by --120--.

Appropriate correction is required.

3. The petition for the acceptance of the declaration filed under 37 C.F.R. 1.47 and the attached exhibits have been reviewed by the undersigned and are deemed sufficient as filed.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor

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and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al '222 taken together with Keller, and further in view of any one of Wessman, Yoneda et al, and USSR 652,947.

Lee et al '222 (Figs. 2, 3B, 4, and 6) substantially disclose applicant's invention as recited by instant claims 17-19, except for the outlet weir being multi-chordal in configuration and the openings from the downcomer in the edge portions thereof being sized so as to allow for more liquid to flow through the openings at the edge portions than at the center thereof. The Lee et al '222 reference does specifically disclose the semi-conical downcomer wall of instant claim 18 and the support ring placement of instant claim 19.

Keller (Abstract; Figs. 12, 15, 22, and 23) teaches that it is advantageous to provide a downcomer with openings in the edge portions thereof being sized so as to allow for more liquid to flow through the openings at the edge portions than at the center thereof, thereby providing substantial plug flow of liquid across the trays, thus eliminating efficiency reducing liquid retention upon the tray.

Each of Wessman (20 in Figs. 1 and 2), Yoneda et al (Figs. 1, 4, and 6), and USSR 652,947 (English Abstract; Figs. 1-8) disclose multi-chordal outlet weir structures, which provide a more uniform delivery of liquid to the associated downcomer and the next lower tray,

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thereby increasing tray efficiency by promoting uniform liquid flow across the trays.

USSR 652,947 also teaches inlet weir means (4) that separates the inlet area from the contact area of the next tray.

Wherein Keller clearly teaches the advantages of providing plug flow across contact trays by providing the downcomer with larger flow openings at the edge portions than at the center of the downcomer, it would have been obvious for an artisan at the time of the invention, to modify the flow openings from the downcomer of Lee et al '222 to be non-uniform in the manner as taught by Keller, since such would increase the efficiency of each tray, thereby reducing the number of total trays required in the column. Furthermore, it would have also been obvious for an artisan at the time of the invention, to modify the outlet weir structure of Lee et al '222, to that of a multi-chordal design, in view of any one of Wessman, Yoneda et al, and USSR 652,947, since such also promotes uniform liquid flow across the trays thereby increasing tray efficiency.

6. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al '222 taken together with Keller.

Lee et al '222 (Figs. 2, 3B, 4, and 6) substantially disclose applicant's invention as recited by instant claims 30-32, except for the openings from the downcomer in the edge portions thereof being sized so as to allow for more liquid to flow through the openings at the edge portions than at the center thereof. The Lee et al '222 reference does specifically disclose the semi-conical downcomer wall of instant claim 31 and the supporting ring placement of instant claim 32.

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Keller (Abstract; Figs. 12, 15, 22, and 23) teaches that it is advantageous to provide a downcomer with openings in the edge portions thereof being sized so as to allow for more liquid to flow through the openings at the edge portions than at the center thereof, thereby providing substantial plug flow of liquid across the trays, thus eliminating efficiency reducing liquid retention upon the tray. Wherein Keller clearly teaches the advantages of providing plug flow across contact trays by providing the downcomer with larger flow openings at the edge portions than at the center of the downcomer, it would have been obvious for an artisan at the time of the invention, to modify the flow openings from the downcomer of Lee et al '222 to be non-uniform in the manner as taught by Keller, since such would increase the efficiency of each tray, thereby reducing the number of total trays required in the column.

7. Claims 20-22, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al '222 taken together with Keller, and further in view of USSR 652,947.

Lee et al '222 (Figs. 2, 3B, 4, and 6) substantially disclose applicant's invention as recited by instant claims 20-22, 33, and 34, except for the outlet weir being multi-chordal in configuration, the inlet weir separating the inlet area from the second tray area, and the openings from the downcomer in the edge portions thereof being sized so as to allow for more liquid to flow through the openings at the edge portions than at the center thereof. The Lee et al '222 reference does specifically disclose the plurality of venting chambers as recited by instant claims 22 and 34.

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Keller (Abstract; Figs. 12, 15, 22, and 23) teaches that it is advantageous to provide a downcomer with openings in the edge portions thereof being sized so as to allow for more liquid to flow through the openings at the edge portions than at the center thereof, thereby providing substantial plug flow of liquid across the trays, thus eliminating efficiency reducing liquid retention upon the tray.

USSR 652,947 (English Abstract; Figs. 1-8) discloses multi-chordal outlet weir structures, which provide a more uniform delivery of liquid to the associated downcomer and the next lower tray, thereby increasing tray efficiency by promoting uniform liquid flow across the trays.

USSR 652,947 also teaches inlet weir means (4) that separates the inlet area from the contact area of the next tray.

Wherein Keller clearly teaches the advantages of providing plug flow across contact trays by providing the downcomer with larger flow openings at the edge portions than at the center of the downcomer, it would have been obvious for an artisan at the time of the invention, to modify the flow openings from the downcomer of Lee et al '222 to be non-uniform in the manner as taught by Keller, since such would increase the efficiency of each tray, thereby reducing the number of total trays required in the column. Furthermore, it would have also been obvious for an artisan at the time of the invention, to modify the outlet weir structure of Lee et al '222, to that of a multi-chordal design, in view of USSR 652,947, since such also promotes uniform liquid flow across the trays thereby increasing tray efficiency. Furthermore, it would have also been obvious for an artisan at the time of the invention, to provide the apparatus of Lee et al '222, with inlet

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weir means that separates the inlet area from the contact area of the next tray, in view of USSR 652,947, since such also promotes uniform liquid flow across the trays thereby increasing tray efficiency.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bushey whose telephone number is (703) 308-3581.

C. SCOTT BUSHEY
PRIMARY EXAMINER
GROUP 1300

csb

July 1, 1998



7-1-98